Hawai'i Travel Scholarship Report: Exploring native plants and In-situ conservation methods at National Tropical Botanic Garden (NTBG) Hawai'i

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Acknowledgements

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Hibiscus kokio subsp. saintjohnianus

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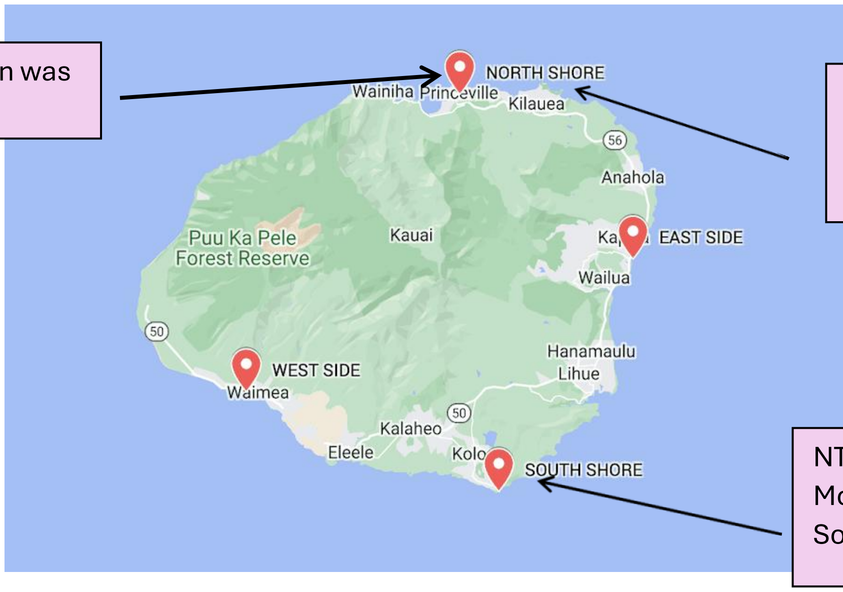
Introduction

Hawaiʻi's isolation has created exceptionally high levels of endemism, making many of its plants both uniquely valuable and highly vulnerable. Kauaʻi, often called the "Garden Isle," is renowned for its lush vegetation and floristic diversity. We spent two weeks on this particular island volunteering with the National Tropical Botanical Garden (NTBG).

Our accommodation was based in Princeville



Limahuli Preserve: NTBG's garden on the North Shore

NTBG's Allerton and McBryde Gardens in the South

Alternating between the gardens on the North and South Shore, offered us a chance to deepen our understanding of tropical horticulture and conservation. At Cambridge University Botanic Garden, several Hawaiian species are grown in the glasshouse, including Polyscias *racemosa* (Araliaceae), *Hibiscadelphus distans* (Malvaceae) and *Hibiscus clayii* (Malvaceae), it was particularly valuable to see these plants in their natural environment.

***Hibsicus Clayii* is a threatened species endemic to Kauai. It is found across several botanic gardens globally, including Cambridge University Botanic Garden**

Botanic gardens play an increasingly important role in protecting rare and threatened species, making it essential to understand how these plants grow and survive in the wild.

Institutions such as NTBG, are leaders in both in-situ and ex-situ conservation, and with many species now under pressure from climate change, illegal collection, and habitat loss, these gardens will continue expanding their efforts to safeguard plants for research and conservation for future generations.

Aims and Objectives

Before travelling to Hawai'i, we came up with a series of objectives to achieve during our visit:

1. Develop fieldwork skills in a tropical environment, allowing us to apply our training in floristic surveys and data collection into practice.
2. Study plants of cultural significance, gaining a deeper understanding of Hawaiian ethnobotany and how indigenous knowledge contributes to ongoing conservation efforts.
3. Observe how NTBG successfully blends in-situ and ex-situ conservation, offering a model that could inform our work at CUBG.
4. Enhance our understanding of endemism, learning how island flora adapts to environmental pressures and how conservation strategies can mitigate biodiversity loss.

Itinerary:

16/8/25 - Leave Heathrow (early flight)

17/8/25 - Arrive in Kaua'i (Late the following evening)

18/8/25 – Admin day/prep for week at NTBG and exploring Flora around Princeville

19/8/25 - Volunteer in the lower preserve, hike to the site (30mins from the Limahuli site) to assist in collections care: mulching, weeding, planting etc.

20/8/25 – Habitat restoration along Limahuli stream

21/8/25 – Assisting with volunteer duties at Limahuli

22/8/25 – Travel down to the NTBG South Shore site

23/8/25 and 24/8/25- Garden Closed (Weekend)

25/8/25 - Volunteering at Limahuli's Native Forest Reserve

26/8/25 – Final Day at South Shore Garden

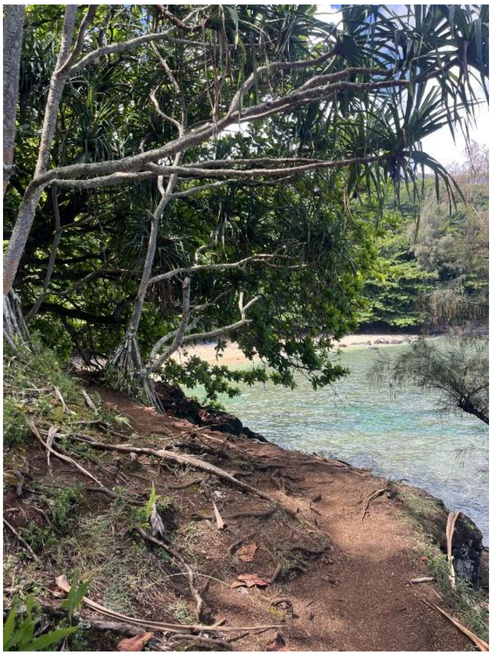
27/8/25 – Flight back to Heathrow

Day 1- After a long 18-hour flight from Heathrow, we spent our first day settling into our accommodation in Princeville and exploring the local area. It was a great chance to start observing the local flora right away. While Hawaii is known for its high plant endemism, non-native plants that have naturalized over time are much more commonly seen.

Throughout Princeville, there was a floral display almost on every corner, and nearly all the streets were lined with Coconut palms (Cocos nucifera) or Plumeria rubra. It was also common to see various Hibiscus hedges creating borders between houses.

From an ornamental perspective, the displays and overall plant selections were impressive. However, the majority of these displays did predominantly consist of non-native plants.

In the afternoon, we walked along a nature trail that eventually led to the beach, where we spotted our first two native plants: *Pandanus tectorious* and *Scaevola sericea*.



We were initially a bit apprehensive about staying in Princeville. Like many places in Hawaii, it's a highly gentrified neighbourhood, known for luxury condos and golf courses. However, since neither of us was driving, we were advised that this location was the most convenient for accessing the gardens via public transport. After thorough research, it also proved to be the most cost-effective option within our budget, which allowed us to travel more sustainably.

Left: *Bauhinia monandra* (Fabaceae) native to Madagascar

Right: *Aechmea blachetiana* (Bromeliacee) from Eastern Brazil

Below: *Dendrobium bigibbum* (Orchidaceae) from Australia

Reflecting on the trip over the next couple of weeks, it became clear that staying in Princeville actually offered a useful perspective, highlighting the contrast between Kauai's naturalised landscapes and its ornamental landscaping.

Day 2- As we made our way to Limahuli, it was reassuring to see an increase in mountains, forests, and native plants in comparison to Princeville. Upon arrival, we were warmly welcomed by the preserve team: Uma, Puakea, Laura, and Delilah. To start with, Laura gave us a tour of the main nursery, where all plants grown and propagated are planted out in-situ.

Some of the plants included:

- **Moa** (*Psilotum nudum*)
- **Mamaki** (*Pipistrus albidus*)
- **'Ohi' a lehua** (*Metrosideros polymorpha*)

This was a great opportunity to familiarise ourselves with the Hawaiian names of plants that we would be planting in the reserve later that day.

Limahuli Preserve spans 1,000 acres and is dedicated to the perpetuation of native and endemic Hawaiian species. While there are around 9,000 species across 100 genera, much of the lowland areas have been affected by invasive species, highlighting the importance of conservation in-situ conservation that is carried out here. Before entering the forest, we joined in a traditional chant asking permission to enter. Throughout the trip, we found that respecting the land and maintaining relationships between people and nature seemed to be an intrinsic part of Hawaiian culture.

In the afternoon, we gathered plants and tools before hiking into the main preserve. It was a real privilege to visit the preserve, as it is not open to the general public. The hike involved climbing over large rocks and crossing streams, with trails that were extremely narrow at times.

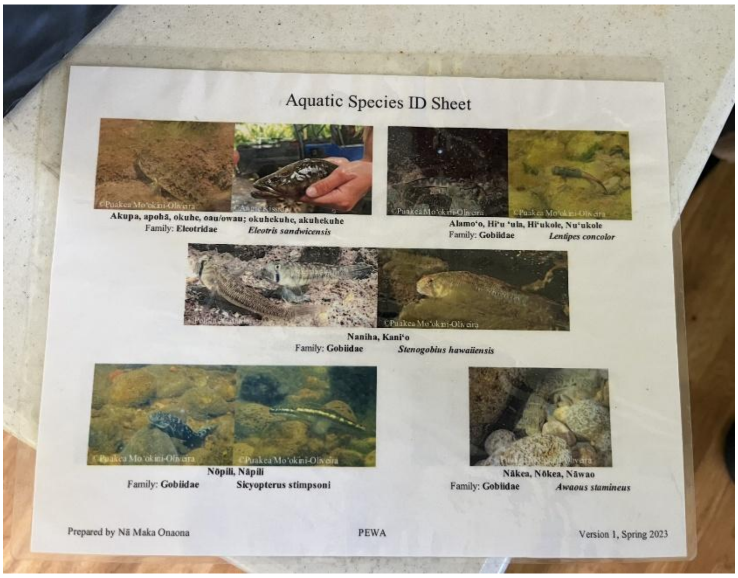
Using maps and GPS devices, we carefully located planting sites.

We planted out a combination of native trees and herbaceous perennials such as:

- **Koa** (Acacia koa)
- **'ili'e'e** *(Plumbago zeylanica*)
- **Kukui** (*Aleurites moluccanus*)

Day 3 and 4- For the next couple of days, we had the chance to get involved with habitat restoration alongside the preserve team, this time focusing on Limahuli Stream. The stream plays a crucial role in the health of the whole valley. Its water feeds the surrounding ecosystems and restoring it ties directly into the traditional Hawaiian ahupuaʻa system, which recognises the natural connection between mountains, streams, and the ocean.

We spent time learning about the native aquatic species that depend on healthy streams, in particular the ʻoʻopu alamoʻo,- a small goby that's endemic to Hawaiʻi. It has an incredible ability to climb waterfalls and steep, slippery rocks by using a suction-like disc on its belly and its mouth to inch its way upstream.



The juveniles start their lives in the ocean, and when they return to freshwater they are able to climb their way back up the streams to reach their adult habitat.

We gathered plants and tools once again, and continued planting along the bank of the stream, The team explained that planting native seedlings here would eventually help stabilise the edges of the bank, as well as create a healthier habitat for both the surrounding forest and the aquatic life. Once we completed the task, we had an opportunity to snorkel and look for the fish hidden amongst the rocks.

Day 5 (South Shore – NTBG McBryde Garden)

We travelled down to the South Shore, where we spent the day at NTBG's McBryde Garden. This part of the island has a noticeably different microclimate from the North Shore. The air felt hotter and much drier, with far less humidity, and it was interesting to see how the change in climate influenced the types of plants growing there and the challenges the garden team deals with.

We started with a tour of the South Shore gardens and learned more about the role this site plays within NTBG. McBryde is home to one of the largest collections of native Hawaiian plants and acts as a major centre for conservation, research and seed banking. The conditions here make it an ideal place to grow species that prefer drier, more open environments.

***Pritchardia sp*. also known as 'Loulu' is Hawai'i's only native palm**

Coconut rhinoceros beetle (*Oryctes rhinoceros*)

Our practical work for the day included weeding, and helping the team with netting *Loulu* (*Pritchardia*) This was part of the ongoing effort to protect the palms from the coconut rhinoceros beetle, a serious pest that has caused major damage across Hawai'i. The threats aren't limited to wild forests either; many of Hawai'i's agricultural crops are at risk from the beetle, causing irreversible destruction.

It was actually sad to see the visible deterioration of *cocos nucifera* and many other palms the further south we travelled due to the beetle's prominence in this zone.

Spending time at McBryde gave us a clearer sense of just how different the South Shore environment is, and how those differences shape conservation strategies.

Day 6 and 7 (Weekend)- As the garden was closed over the weekend, we were not required to work. Some of the staff kindly invited us to a Hoʻolauleʻa Waʻa, a traditional canoe celebration taking place along Hanalei Bay. It was the first time this event had been held on Kauaʻi, so it felt like a real privilege to experience it during our visit.

ʻHala' (*Pandanas tectorious*) is a significant plant in native Hawaiian culture. The leaves have been used to make mats and baskets, as well as sails for the canoes.

The festival featured outrigger canoe racing, which holds deep significance in Hawaiian culture. These canoes are a reminder of the original Polynesian voyagers who crossed the Pacific and settled in Hawai'i. They carried with them a selection of essential species known as canoe plants, including kalo, ʻulu, niu and Hala. Each plant served an important purpose for food, shelter, tools or cultural practices. Seeing Hala used in weaving demonstrations at the festival connected directly to its traditional role in canoe building and everyday life.

We also spent time exploring a local farmers' market. Some of the team at Limahuli have highlighted how much potential Kauaʻi has to be self-sufficient, with such fertile land and ideal growing conditions.

Despite this, much of the island's food is still imported, partly due to large areas of land being privately owned or used for development

Day 8- We returned to Limahuli on Day 8 and spent the morning working with Randy along the Native Forest Walk. This part of the garden is designed to showcase what a healthy native Hawaiian forest should look like, highlighting the key species and ecological relationships that once dominated the landscape. Maintaining this area involves constant attention, as invasive plants such as *Schefflera actinophylla* and *Psidium guajava* (Guava) have been known to take over an outcompete native plants at a rapid rate.

Despite being from Southeast Asia, *Cheilocostus speciosus* (Costaceae) has naturalised across the Hawaiian islands.

Our main task for the day was weeding and removing invasive species. Randy explained the purpose of keeping this area as close to a natural native forest as possible.

It serves not only as an educational trail for visitors but also as a living example of what the wider valley could look like with continued restoration.

Randy described it as “A way to reconnect people with the original plant communities of the area and reinforces the importance of protecting what remains.”

It was common to see signs like this throughout the garden, which proved to be an effective way to engage the public with plant conservation.

Day 9- We worked in Limahuli's Plantation Garden, with Angie, the volunteer coordinator. The plantation garden contains a mix of native and historically cultivated plants and has been designed intentionally for ornamental display.

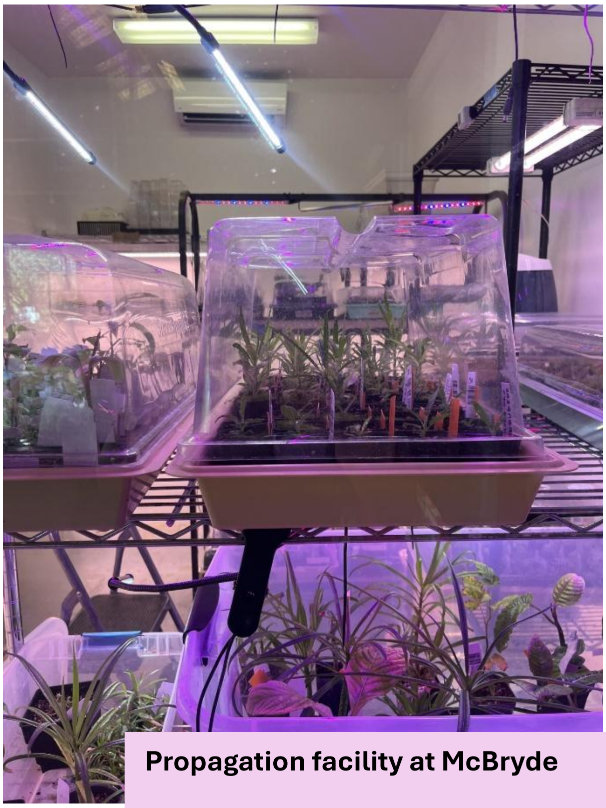
Although Plumeria, is culturally significant in Hawai'i, and extremely abundant, it is not native. Many people are surprised to know this, since it is a flower that is associated so heavily with the culture

We had the opportunity to hard-prune *Monstera deliciosa* (Araceae) in order to show off the native Pua Male, known as the 'Hawaiian wedding flower' *(Stephanotis floribunda*)

Trichoglottis purpurea (Orchidaceae)

Day 10- On our final day, we returned to the South Shore Garden and worked with Kevin from the Plant Records team.

We spent the day auditing and re-accessioning plants, across both Allerton and McBryde gardens. Many plants needed new labels, and we had to ensure that all specimens were correctly documented. Kevin also took the time to show us a variety of rare plants that are endemic to Kaua'i.



Propagation facility at McBryde

Hibiscus Waimea **(Malvaceae) is an endemic species in Kaua'i found within the Southwestern valleys of the Waimea canyon.**

Brighamia insignis **(Campanualceae) also known as Alula, is a threatened species in Kaua'i.**

It is extinct in the wild, due to the scarcity (and possible extinction) of its sole pollinator, the Green Sphinx Moth. NTBG are trying to preserve current populations and hopefully reintroduce them back into the wild in the future, as potential pollinators continue to be researched.

Personal experience of the trip

I’m really grateful for my time In Kaua’i and have improved my scientific and cultural understanding of native and endemic Hawaiian plants within their natural habitat. My experience at NTBG was incredibly immersive, giving me hands-on experience of in-situ conservation methods. The stream restoration project was especially rewarding, as it allowed us to contribute to meaningful habitat work while learning how traditional management systems like ahupua’a and modern conservation approaches intersect.

Additionally, working with different teams across both gardens was a great way for me to further consolidate my knowledge of different horticultural practices that also take place at CUBG. It was useful being able to exchange knowledge with members of the team. I learnt so much about the island’s ecology and how it is so heavily tied into both Hawai’i’s history and modern culture.

Witnessing the impact of invasive fauna and flora made it clear just how fragile Hawai’i is. However, it has been reassuring to witness the dedication of NTBG staff in carrying out conservation and research to support native plant species for the future. This whole experience has reinforced how much I’d like to be involved in more in-situ conservation going forward and use my horticultural skills to support habitat restoration. Furthermore, having the opportunity to spend time in a tropical environment like Kaua’I has given me a deeper understanding of the local ecology, and a clearer sense of how horticulture and conservation can work hand in hand.

Summary

Our time volunteering at NTBG was extremely valuable and truly was a trip of a lifetime. It was rewarding to develop fieldwork skills in such a unique, tropical environment, applying our training in floristic surveys and plant data collection. We learnt so much about Hawaiian plants of cultural significance, gaining a deeper understanding of ethnobotany and how traditional indigenous knowledge informs ongoing conservation throughout Hawai'i.

We observed that, aside from environmental challenges, gentrification and increased tourism can directly threaten plant life. In areas like Princeville, homeowners' associations (HOAs) often enforce strict planting schemes to maintain a consistent aesthetic, which reduces native plant diversity. Additionally, large developments such as golf courses further impact the landscape through heavy irrigation and spraying.

It was bittersweet to witness the richness of Kaua'i's biodiversity while recognizing how many native plant species have already been lost. However, these pressures highlight the importance of education and the role of botanic gardens like NTBG and CUBG, in raising public awareness and promoting plant conservation.

The trip has been hugely insightful for both of us, strengthening our interest in tropical horticulture and conservation. Following our traineeship at CUBG, we are keen to build careers in plant conservation and continue developing our knowledge of tropical ecosystems.

Budget Breakdown

Flight Costs	£1617.12
Travel Insurance	£41.09
Daily Transport	£600
Accommodation	£1950
Food	£475
Train Fare (To and from Heathrow)	£49.25
Visa	£21.00
Total	£4,753.46